

What is claimed is:

1. A method of inhibiting proliferation of tumor cells characterized by having a highly glycolytic phenotype comprising contacting the cells with a proliferation inhibitory effective amount of an antisense polynucleotide or oligonucleotide that hybridizes with a mRNA encoding a hexokinase under conditions that allow hybridization of the antisense polynucleotide with the mRNA, thereby inhibiting the proliferation of tumor cells.
2. The method of claim 1, wherein the mRNA encoding hexokinase has a nucleotide sequence complementary to a sequence as set forth in SEQ ID NO:1.
3. The method of claim 1, wherein the hexokinase is Type II hexokinase.
4. The method of claim 1, wherein the hexokinase is Type I hexokinase.
5. The method of claim 1, wherein the mRNA encoding hexokinase has a nucleotide sequence complementary to a sequence as set forth in SEQ ID NO:2.
6. The method of claim 1, wherein the antisense polynucleotide or oligonucleotide comprises at least one modified internucleoside linkage.
7. The method of claim 6, wherein the modified internucleoside linkage is a phosphorothioate linkage.
8. The method of claim 1, wherein the antisense oligonucleotide comprises at least one modified sugar moiety.
9. The method of claim 8, wherein the modified sugar moiety is a 2'-O-methoxyethyl sugar moiety.
10. The method of claim 1, wherein the antisense oligonucleotide comprises at least one modified nucleobase.
11. The method of claim 10, wherein the modified nucleobase is a 5-methylcytosine.

12. The method of claim 1, wherein the antisense oligonucleotide is a chimeric oligonucleotide.
13. The method of claim 1, wherein the tumor cells are located in a tissue selected from the group consisting of brain, colon, urogenital, lung, renal, prostate, pancreas, liver, esophagus, stomach, hematopoietic, breast, thymus, testis, ovarian, and uterine tissue.
14. The method of claim 1, wherein prior to treating tumor cells with the antisense polynucleotide or oligonucleotide, the cells are diagnosed as highly glycolytic by obtaining a specimen selected from the group consisting of serum, urine, saliva, blood, cerebrospinal fluid, pleural fluid, ascites fluid, sputum, stool, bone marrow and biopsy sample.
15. The method of claim 1, wherein said cellular proliferative disorder is selected from the group consisting of low grade astrocytoma, anaplastic astrocytoma, glioblastoma, medulloblastoma, gastric cancer, hepatoma, colorectal cancer, colorectal adenoma, acute myelogenous leukemia, lung cancer, renal cancer, leukemia, breast cancer, prostate cancer, endometrial cancer, bone cancer, squamous cell cancer and neuroblastoma.
16. A method of modulating the expression of a hexokinase in a tumor characterized as having a highly glycolytic phenotype comprising contacting tumor cells or tissue with an antisense polynucleotide or oligonucleotide that hybridizes with the hexokinase encoding mRNA such that hexokinase enzyme translation is inhibited.
17. A pharmaceutical preparation useful for inhibiting proliferation of tumor cells comprising an antisense polynucleotide that hybridizes with a mRNA encoding a hexokinase in a pharmaceutically effective carrier.
18. The pharmaceutical preparation of claim 17, wherein the antisense polynucleotide has a sequence complementary to the sequence set forth in SEQ ID NO:1.

19. A recombinant nucleic acid vector comprising the following elements operably linked in a 5' to 3' direction:

- (a) a 5' long terminal repeat (LTR) sequence;
- (b) a multiple cloning site (MCS);
- (c) an internal ribosome entry sequence (IRES);
- (d) a selectable marker sequence; and
- (e) a 3' long terminal repeat (LTR) sequence.

20. The vector of claim 19, wherein the selectable marker sequence is a neomycin resistance sequence.

21. The vector of claim 19, wherein the vector has the sequence set forth in SEQ ID NO:3.

22. The vector of claim 19, further comprising a polynucleotide having the nucleotide sequence complementary to the sequence set forth in SEQ ID NO:1, said polynucleotide located 5' of the IRES sequence.

23. A recombinant nucleic acid molecule comprising a polynucleotide complementary to a nucleotide sequence encoding Type II hexokinase.

24. The recombinant nucleic acid molecule of claim 23, wherein the polynucleotide has a nucleotide sequence complementary to the sequence set forth in SEQ ID NO:1.

25. A recombinant nucleic acid molecule comprising an polynucleotide complementary to a nucleotide sequence encoding Type I hexokinase.

26. The recombinant nucleic acid molecule of claim 25, wherein the polynucleotide has a sequence complementary to the nucleotide sequence set forth in SEQ ID NO:2.